



# PUMA 600 / 700 / 800

Heavy Duty Turning Center



# Massive yet Responsive Most Powerful Machines in Their Class.



The PUMA 600/700/800 series turning centers are the most powerful machines in their class. Designed for heavy and interrupted cutting, holding long term accuracies, and maintaining superior finishes. High metal removal rates along with rapid positioning and high speed turret indexing, guarantee unmatched cycle times when real performance is essential. Proven manufacturing techniques and ultra rigid construction are combined with advanced technological features to produce superior machine with exceptional values.

Heavy Duty Turning Center

**PUMA 600 / 700 / 800**





# Main Spindle PUMA 600/700/800

Max. spindle speed **1800** r/min (PUMA 600)

Motor (30 min) **45** kW (60.3 Hp)

## Main Spindle Drive

The 45kW (60.3Hp) spindle motor provides power for heavy stock removal, greatly reducing the number of roughing passes required. The reliable digital AC spindle motor provides fast acceleration and is maintenance free. The preloaded spindle bearings are specifically calibrated to maintain the perfect balance of rigidity and speed. The geared headstock ensures optimal power throughout a wide speed range.

## Headstock and Spindle Construction

The headstock casting is made of Meehanite and ribbed on the outside to increase the surface area for better heat dissipation. The headstock and main spindle are manu-factured in a temperature controlled environment then assembled and tested in our clean room. The heavy duty cartridge type spindle is supported by a double row of cylindrical roller bearings in the front and rear, with duplex angular thrust bearings in between. The cylindrical roller bearings feature a large contact surface which ensures the highest rigidity for heavy loads and superior surface finishes. All spindle bearings are permanently grease lubricated precision class P4.

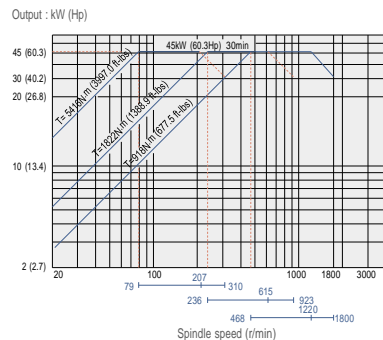
## Geared Head



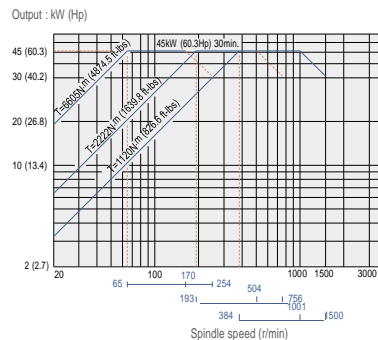
three (PUMA 600/L/M/LM, 700/L/M/LM) or two (PUMA 800/L/M/LM, PUMA 800B) speed geared head allowing stable spindle speeds change as well as powerful torque.

## Main spindle power-torque diagram

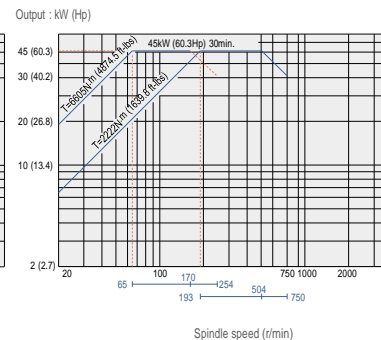
PUMA 600/600L/600M/600LM (Max. 1800 r/min)



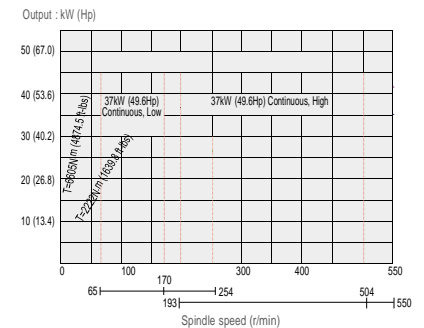
PUMA 700/700L/700M/700LM (Max. 1500 r/min)



PUMA 800/800L/800M/800LM (Max. 750 r/min)



PUMA 800B (Max. 550 r/min)





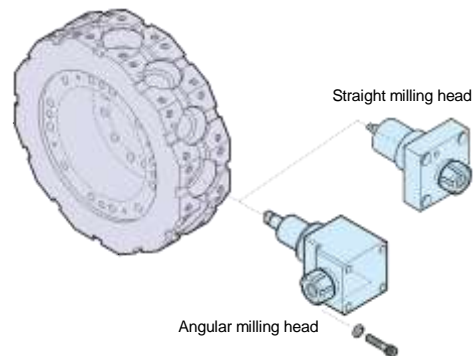
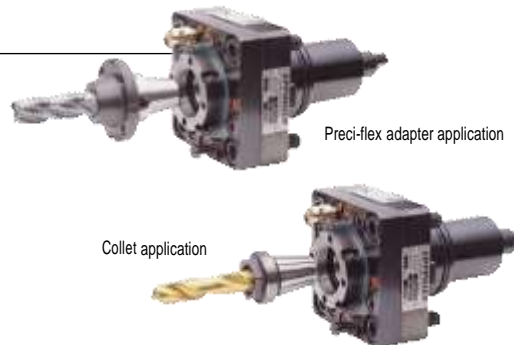
# Turret PUMA 600/700/800

Index time (1-station swivel) **0.25 s**

No. of tool station **12 stations**

## Preci-Flex Ready Rotary Tools

Preci-Flex ready rotary tool holders are available on the milling versions. Preci-Flex is a tooling system utilizes the existing ER collet taper in the rotary holders. The spindle face is precision ground relative to the taper and there are four drilled and tapped holders in this face. The Preci-Flex adapters locate on both the taper and the spindle face for maximum rigidity.



## Heavy Duty Turret

The large 12 station heavy duty turret features a large Curvic coupling diameter. This heavy duty design provides unsurpassed rigidity for heavy stock removal, fine surface finishes.



## Turret Saddle

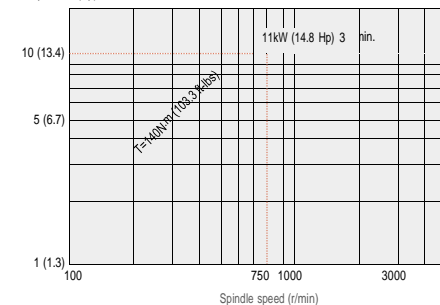
The turret saddle is made from the same fine grained Meehanite process cast iron as the main casting and headstock casting. This ensures that any vibration or harmonics from the cut will be virtually eliminated. The X axis guideways are the wide wrap around rectangular type for unsurpassed long-term rigidity and accuracy.



## Rotary tool spindle power-torque diagram

**PUMA 600[LM]/700M[LM]/800M[LM] : 11 kW (14.8Hp)/30min**

Output : kW (Hp)



# Bed and Way Construction PUMA 600/700/800

Doosan Infracore precision machine tools are internationally known for their durability, rigidity and high accuracy. Only well proven and time tested manufacturing techniques can produce machines of this quality.

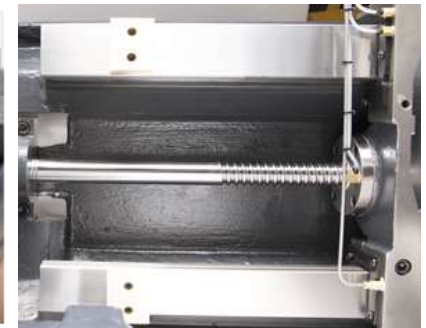


The PUMA 600/700/800 series is a true 45 degree slant bed design. The bed is a one piece casting with both the saddle and tailstock guideways in the same plane to eliminate thermal distortion. The heavily ribbed torque tube design prevents twisting and deformation. Fine grain Meehanite processed cast iron is used because of its excellent dampening characteristics. This ensures high rigidity with no deformation during heavy cutting. The slant angle allows for easy loading, changing and inspection of tools. All guideways are wide wrap-around rectangular type for un-surpassed long-term rigidity and accuracy. The guideways are widely spaced to ensure stability and fully protected. Each guide-way is induction hardened and precision ground. A fluoro plastic resin, Rulon® 142, is bonded to the mating way surfaces, for its wear and friction characteristics and then hand scraped for a perfect fit and center height. Optional long bed enables extra-long shaft machining.

## Rapid Traverse

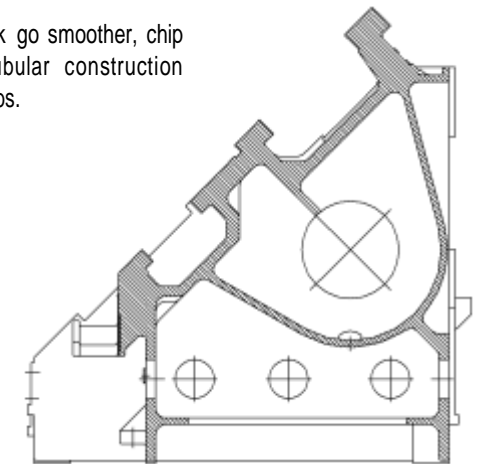


Scraping of Slideway



Outstanding rigidity for high feedrates

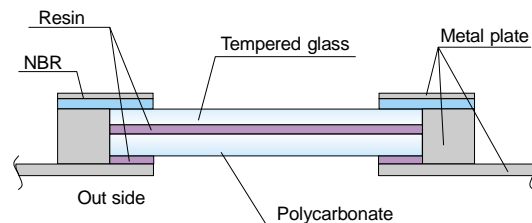
Slant-design bed makes the work go smoother, chip removal much easier. Tough tubular construction stands up to the hardest cutting jobs.



## Human Friendly

### Double-Paneled Safety Window

The operator safety can be enhanced through the front door with its shock absorbing laminated glass and double panel construction. The windows without grating also provide a clear view of the machine inside.



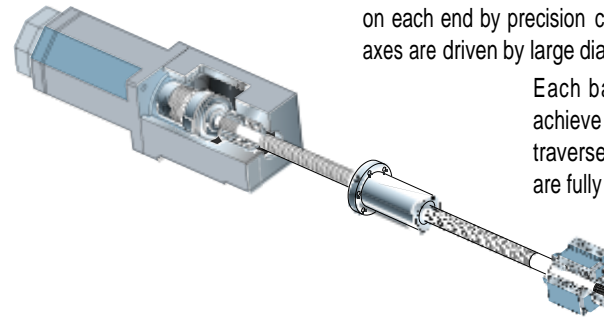
### Operator's Panel

The operator control panel is mounted on an adjustable pendant for easy viewing and accessibility during set-up and operation. The layout and location of the panel is ergonomically designed to be efficient and convenient for the operator. Comprehensive alarm diagnostics are provided for the machine, control and programming error.



## Axis Drive Construction and Tail Stock

### Double Pretensioned Ball Screw



The X and Z axes features a double pretensioned ball screw, supported on each end by precision class P4 angular contact thrust bearings. Both axes are driven by large diameter, high precision ball screws.

Each ball screw has been carefully selected to achieve a combination of high accuracy, high rapid traverse rates and high feed thrust. All ball screws are fully supported on both ends.



### Axis Drives

Each axis is powered by a maintenance free digital AC servo motor. These high torque drive motors are connected to the ball screws without intermediate gears for quiet and responsive slide movement with virtually no backlash.

### Programmable Tailstock

The programmable tailstock body is mounted on the same guideway surface as the headstock. The heavy casting, large 160 mm diameter quill, and precision Morse Taper #6 live center provide outstanding rigidity. The 150 mm quill stroke is activated by either the program or foot switch. Auto lubrication is provided to the quill and guideways.

Note) Above picture is Programmable tailstock with Built-in center(Optional)





# Eco-Friendly Design

## Metered Way Lubrication



Automatic lubrication is provided to all guideways, ball screws and the tailstock quill. A maintenance free piston distributor delivers a precise quantity of oil to each lubrication point. The 4.3 L (1.1 gallon) reservoir lasts up to 80 hours. A low level alarm prevents the machine from restarting without lubricant.

## Hydraulic Power Unit



The temperature of the hydraulic oil is regulated by a cooling system.

## Coolant System



The high pressure flushes chips out of drilled holes, reduces the need for peck drill cycles, meets the requirements of most insert drill manufactures and significantly increases tool life. The separate, large 410 L (108.3 gallon) (Long bed type : 570 L (150.6 gallon)) capacity coolant tank and chip pan are separate from the machine bed to prevent heat transfer and easy cleaning.

## Oil Skimmer opt.



The coolant is kept clean and its life is extended with bed casting channels from the Z axis to a separate reservoir. A belt oil skimmer picks up and removes waste oil from the coolant tank that is easily drained.

## Tool Pre-Setter opt.



The automatic tool setter reduces set-up time by minimizing the need for skim cuts, measurements and entering tool offsets. The tool setting arm is moved by an electric motor and can be controlled through the program.

## Hydraulic Steady Rest opt.



3 roller bearings supported steady rest assures smooth & heavy duty cut when cutting the long & slender parts.

## Long Boring Bar opt.

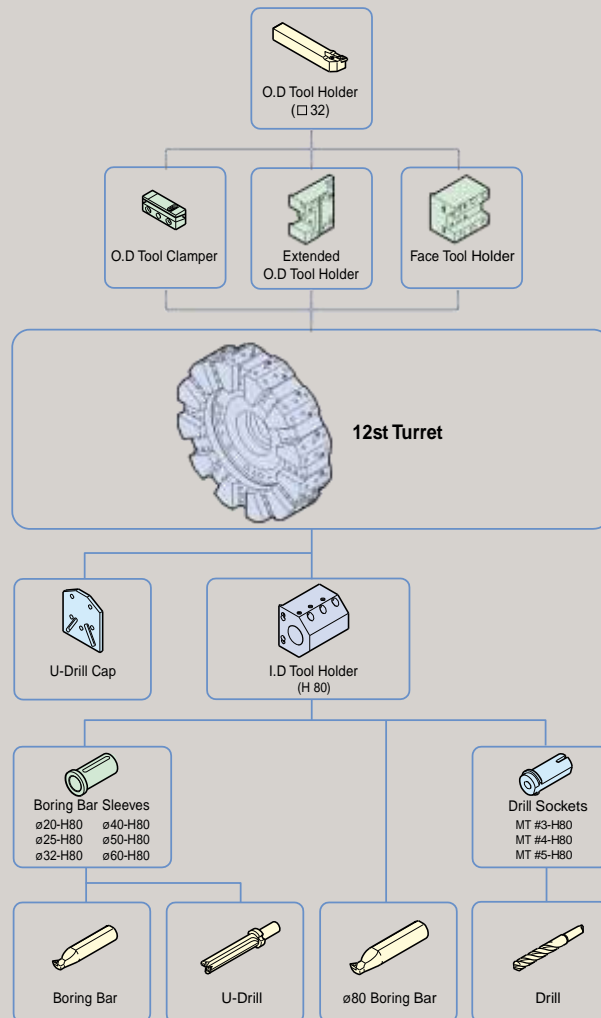


By applying the long boring bar, users could get the deep and long hole of high precision at a time when they make a hole at the workpiece. Also long boring bar is very helpful to save the cutting time. It leads the customer's convenience and the enlargement of flexible using of the product.

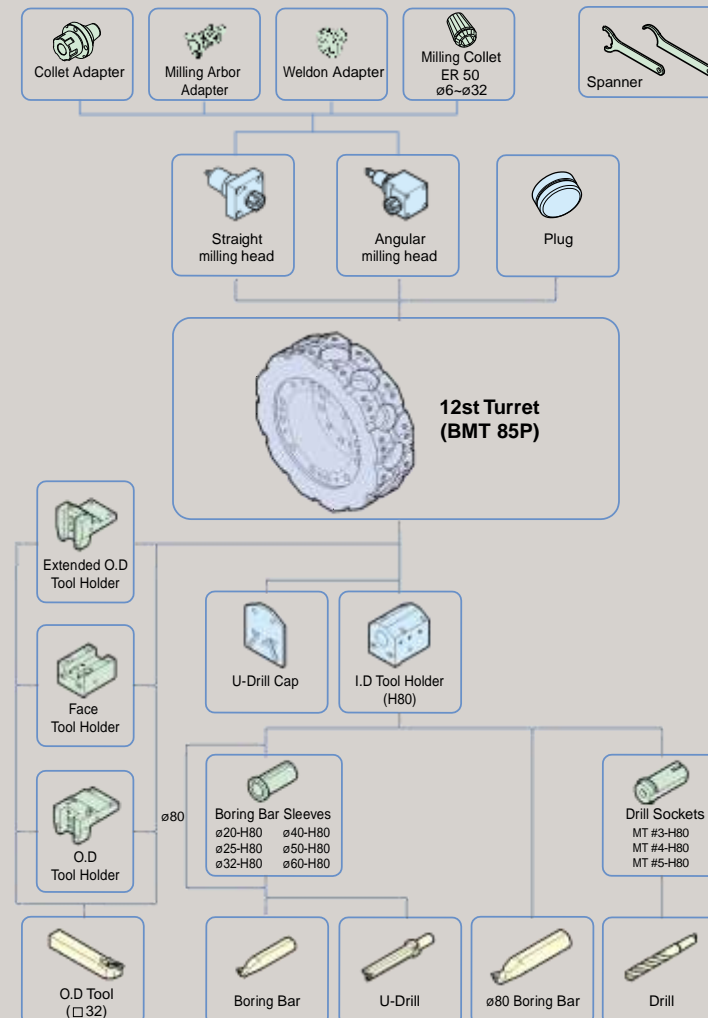
Note) Before confirming customer order, Please contact with Doosan R&D department.  
Turret indexing is impossible when mounting and using long boring bar.



## PUMA 600[L]/700[L]/800[L]



## PUMA 600M[LM]/700M[LM]/800M[LM]

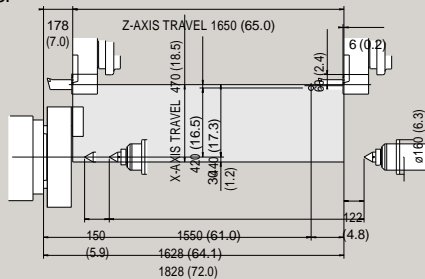


# Working Range

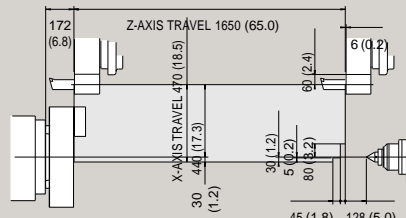
Unit : mm (inch)

## PUMA 600/700/800

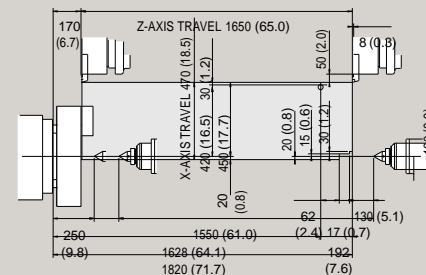
Stroke Diagram  
Holder



ID Tool

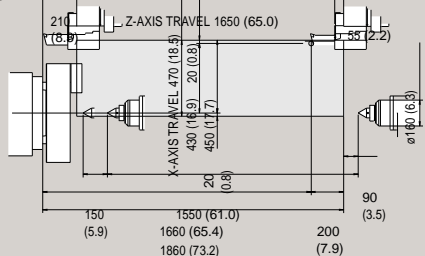


OD Tool Holder

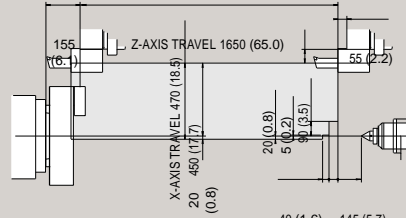


## PUMA 600M/700M/800M

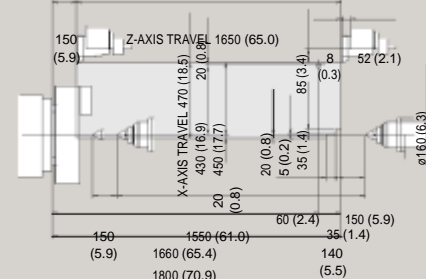
Stroke Diagram  
Holder



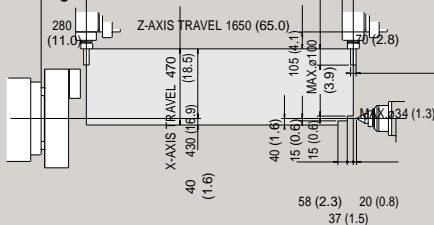
ID Tool



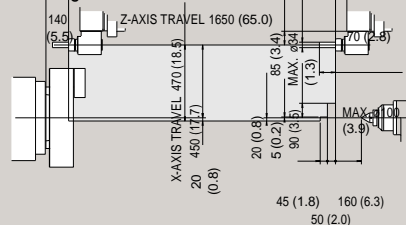
OD Tool Holder



Straight Milling Unit

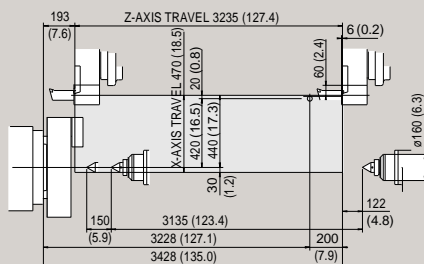


Angular Milling Unit

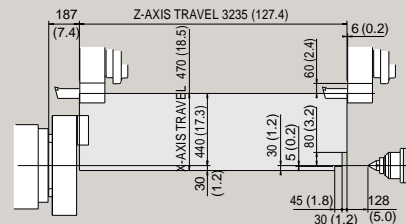


## Unit : mm (inch)

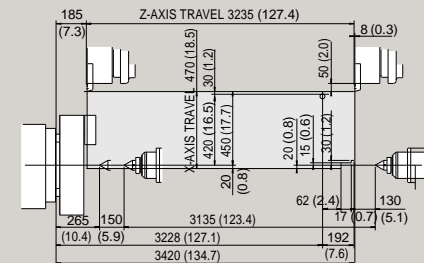
### Stroke Diagram



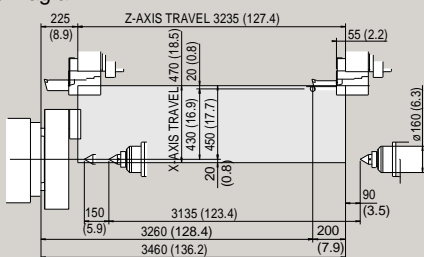
ID Tool Holder



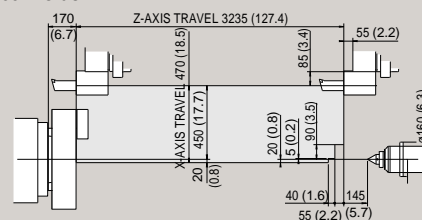
OD Tool Holder



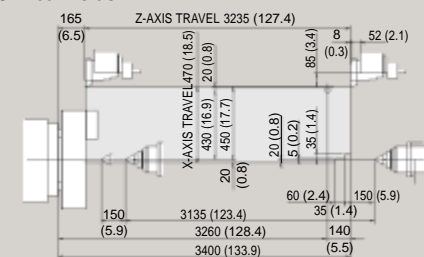
### Stroke Diagram



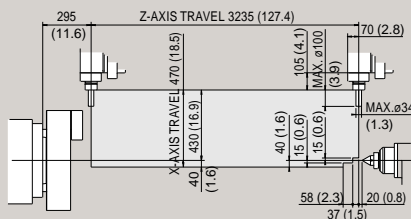
ID Tool Holder



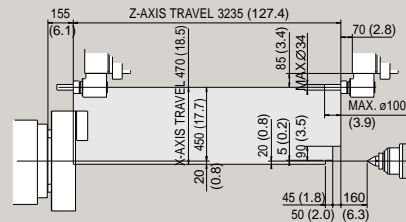
OD Tool Holder



### Straight Milling Unit



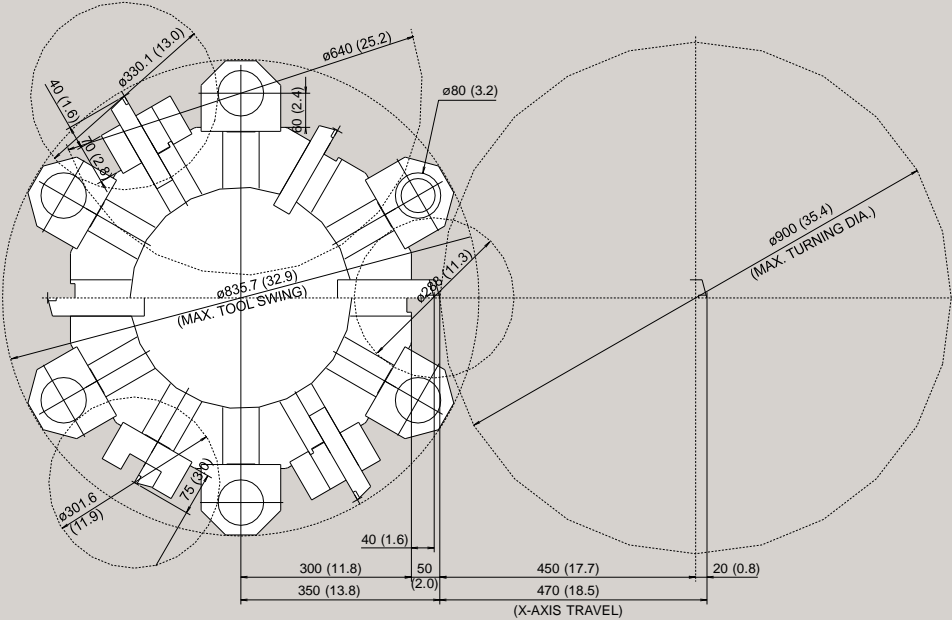
Angular Milling Unit



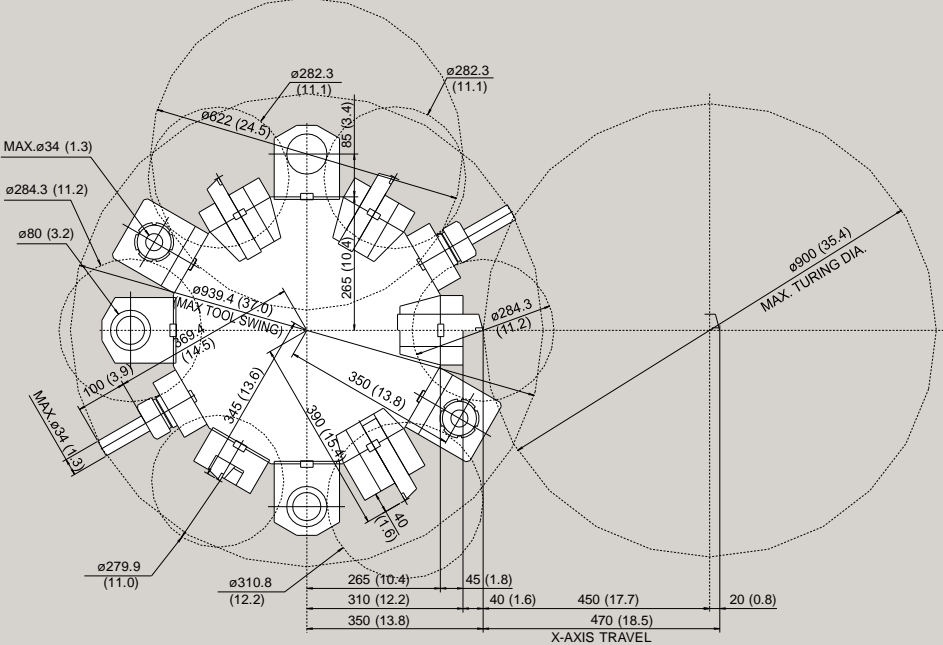
# Tool Interference Diagram

Unit : mm (inch)

**PUMA 600[L]/700[L]/800[L]**



**PUMA 600M[LM]/700M[LM]/800M[LM]**



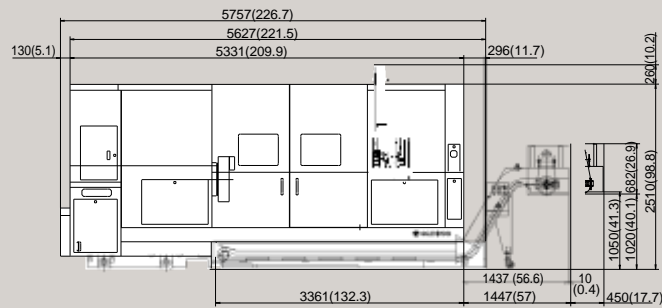


## External Dimensions

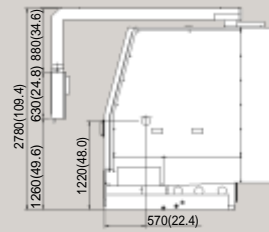
Unit : mm (inch)

## PUMA 600[M]/700[M]/800[M]

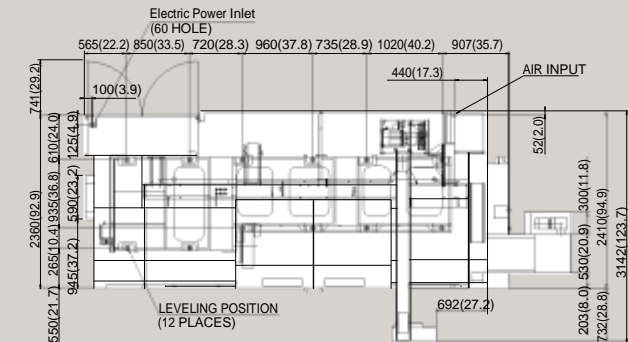
Front View



Side View

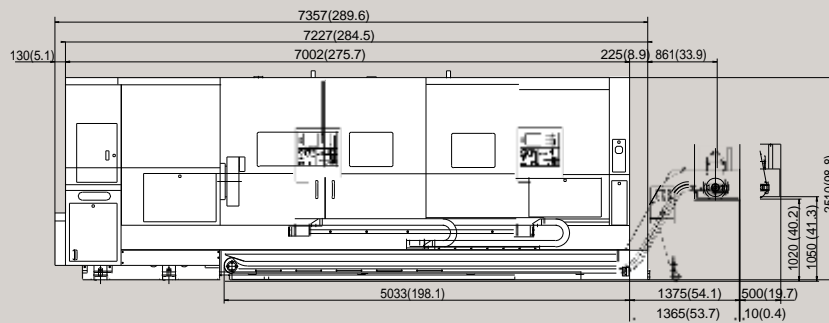


Top View



## PUMA 600L[LM]/700L[LM]/800L[LM]

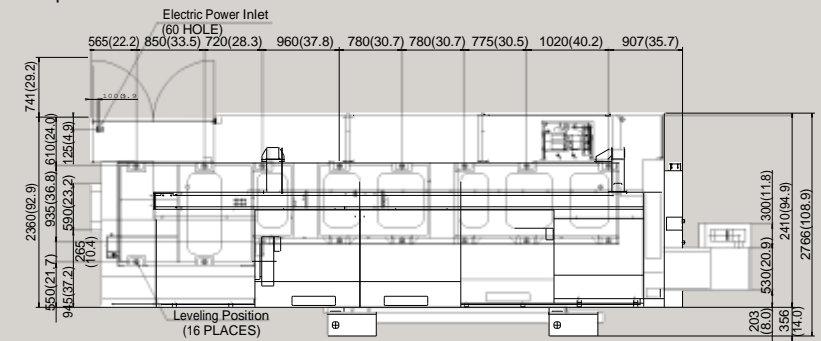
### Front View



Side View



Top View



# Machine Specifications (PUMA 600/700/800)

	Description	Unit	PUMA 600[L]	PUMA 700[L]	PUMA 800[L]	PUMA 600M[LM]	PUMA 700M[LM]	PUMA 800M[LM]	PUMA 800B*	
Capacity	Swing over bed	mm (inch)	1030 (40.6)							
	Swing over saddle	mm (inch)	800 (31.5)							
	Recom. turning diameter	mm (inch)	600 (23.6)	700 (27.6)	800 (31.5)	600 (23.6)	700 (27.6)	800 (31.5)		
	Max. turning diameter	mm (inch)	900 (35.4)							
	Max. turning length	mm (inch)	1600 [3200] (63.0 [126.0])							1600 (63.0)
	Bar working diameter	mm (inch)	117 (4.6)	164 (6.5)	Depending on chuck	117 (4.6)	164 (6.5)	Depending on chuck		
Carriage	Travel distance	X-axis mm (inch)	470 (20+450) (18.5 (0.8+17.7))							
		Z-axis mm (inch)	1650 [3235] (65.0 [127.4])							
Main Spindle	Spindle speed	r/min	1800	1500	750	1800	1500	750	550	
	Spindle nose	ASA	A2 #15	A1 #15	A1 #20	A2 #15	A1 #15	A1 #20	A2 #20	
	Spindle bearing diameter (Front)	mm (inch)	200 (7.9)	240 (9.5)	400 (15.8)	200 (7.9)	240 (9.5)	400 (15.8)	440 (17.3)	
	Spindle through hole	mm (inch)	152 (6.0)	181 (7.1)	320 (12.6)	152 (6.0)	181 (7.1)	320 (12.6)	375 (14.8)	
	Cs spindle index angle	deg	-				360 (0.001)			-
Tool Post	No. of tool station	st	12							
	OD tool height	mm (inch)	32 x 32 (1.3 x 1.3)							
	Boring bar diameter	mm (inch)	ø 80 (3.2)							
	Indexing time (1st swivel)	s	0.25							
	Rotary tool spindle speed	r/min	-			3000			-	
Tail Stock	Quill diameter	mm (inch)	160 (6.3)							
	Quill bore taper	MT#	MT#6							
	Quill travel	mm (inch)	150 (5.9)							
Feedrate	Rapid traverse	X-axis m/min (ipm)	12 (472.4)							
		Z-axis m/min (ipm)	16 [10] (629.9 [393.7])							16 (629.9)
	Max. cutting feedrate	X-axis mm/rev (ipr)	500 (19.7)							
		Z-axis mm/rev (ipr)	500 (19.7)							
Motors	Main spindle motor (cont / 30min)	kW (Hp)	37 / 45 (49.6 / 60.3)							
	Servo motor	X-axis kW (Hp)	4.0 (5.4)							
		Z-axis kW (Hp)	9.0 (12.1)							
	Rotary tool spindle motor	kW (Hp)	-			11 (14.8)			-	
	Coolant pump	kW (Hp)	0.9 (1.2)							
Power Source	Electric power supply (Rated capacity)	kVA	64.44			68.6			64.44	
Machine Size	Machine height	mm (inch)	2780 [2590] (109.5 [102.0])							
	Machine demension	length mm (inch)	5760 [7360] (226.8 [289.8])							
		width mm (inch)	3145 [2770] (123.8 [109.1])							
	Machine weight	kg (lb)	16300 [21800] (35934.8 [48060.1])			16500 [21800] (36375.7 [48060.1])			16300 (35934.8)	
Chuck			Option							

- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan.

\* : No chuck, No cylinder

## Standard Feature

- Coolant supply equipment
- Full enclosure chip and coolant shield
- Hand tool kit, including small hand tool for operations
- Hydraulic actuating cylinder
- Hydraulic power unit
- Leveling jack screw & plates
- Lubrication equipment
- Programmable Tailstock & Live center
- Standard tooling kit (tool holder & boring sleeve)
- Work light (2[3]sets)

## Optional Feature

- Air blast for chuck jaw cleaning
- Arbor type mill holder
- Automatic door with safety device
- Automatic measuring system (in process touch probe)
- Automatic power off
- Chip bucket
- Chip conveyor
- Controller : Fanuc 18i-TB
- Dual chucking pressure
- Hardened & ground jaws
- High pressure coolant pump
- Hydraulic chuck & chuck adapter
- Hydraulic steady rest
- Manual steady rest
- Oil skimmer
- Pressure switch for chucking pressure check
- Programmable tailstock & Built-in center (MT#6)
- Signal tower (yellow, red, green)
- Tool monitoring system
- Tool pre-setter (Hyd.) [PUMA 600/700]
- Twin chuck system [PUMA 800 / 800B]

# NC Unit Specifications

	Item	Spec.	Fanuc 32i-A
Controls	Controlled axes		X, Z, C (!)
	Simultaneously controlled axes	Std. 2 axes	3 axes (!)
Axis Functions	Backlash compensation	0~±9999 pulses	○
	Cs contouring control		○(!)
	Follow-up / Chamfering on / off		○
	HRV2 control		○
	Least input increment	0.001 mm / 0.0001"	○
	Stored stroke check1		○
Operation	Automatic operation (memory) / Buffer register		○
	Handle incremental feed	X1, X10, X100	○
	Search function	Sequence NO. / Program NO.	○
Interpolation	1st, 2nd reference position check / return	G27/ Manual / G28 / G30	○
	Circular interpolation	G02	○
	Continuous threading		○
	Dwell	G04	○
	Linear interpolation	G01	○
	Multiple threading/Thread cutting retract		○
	Polar coordinate interpolation	G12.1, G13.1	○(!)
	Thread cutting / Synchronous cutting		○
Feed Functions	Feed per minute / Feed per revolution		○
	Feedrate override	0 - 200 % (10 % unit)	○
	Jog feed override	0 - 2000 mm/min	○
	Rapid traverse override	F0 / 25 / 100 %	○
	Tangential speed constant control		○
Auxiliary & Spindle Functions	Spindle orientation		○
	Constant surface speed control		○
	M-function	M3 digit	○
	Multi-spindle control		○(!)
	Rigid tapping		○
Programming Functions	Spindle speed override	0~150 %	○
	Absolute / Incremental programming		○
	Canned cycle for drilling / Turning		○
	Custom macro		○
	Decimal point programming / pocket calculator type decimal point programming		○
	Direct drawing dimension programming		○
	EZ Guide i	Conversational programming	○
	Maximum program dimension	± 9 digit	○

	Item	Spec.	Fanuc 32i-A
Programming Functions	Multi repetitive canned cycle	G70~G76	
	Multi repetitive canned cycle 2		
	Optional block skip	9 piece	
	Sequence number	N8 digits	
	Programmable data input	G10	
	Sub program call	10 folds nested	10
	Tape format for FANUC series 10/11		
	Tape format for FANUC series 15		-
	Work coordinate system selection	G52 ~ G59	
Tool Functions	Tool offset	G43, G44, G49	
	Tool monitoring system		Opt.
	Direct input of tool offset value measured B		
	Tool geometry / wear compensation	Geometry & wear data	
	Tool life management		
	Tool nose radius compensation		
	Tool number command (T-code function)	T2+2 digits	
	Tool offset pairs		64
Editing op. Functions	Tool offset value counter input		
	Background editing		
	Expanded part program editing	Copy, Move, Change of NC program	
	No. of Registered programs		500 ea
	Part program editing / Program protect		
Setting & Display	Part program storage length*1		640 m
	Display of spindle speed and T-code at all screen		
	Help function	Alarm&Operation display	
	Self diagnostic function		
	Servo setting screen / Spindle setting screen		
Data input & Output	Status display		
	External key input / External data input		
	External work number search	15 points	
	I/O interface	RS-232C	
Other Functions	Memory card input and output		
	Reader puncher control	CH1 interface	
	Ethernet function	Embedded ethernet function	
	MDI / DISPLAY unit		10.4" Color TFT LCD
	PMC system		

○ : Standard, OPT : Option, (!) : only M type

\*1 : Standard Part program length is different on export condition. On the addition of optional functions, its length can be reduced.

## PUMA 600 / 700 / 800

Heavy Duty Turning Center



<http://www.doosaninfracore.com/machinetools>

### Doosan Infracore Machine Tools

#### Head Office :

Doosan Tower 23rd FL., 18-12, Euljiro-6Ga, Jung-Gu, Seoul, Korea 100-730  
Tel : ++82-2-3398-8693 / 8671 / 8680 Fax : ++82-2-3398-8699

#### Doosan Infracore America Corp.:

19 Chapin Rd. Pine Brook, NJ 07058, U.S.A. Tel : ++1-973-618-2500 Fax : ++1-973-618-2501

#### Doosan Infracore Germany GmbH :

Hans-Böckler-Strasse 29, D-40764 Langenfeld-Fuhrkamp, Germany. Tel : ++49-2173-8509-0 Fax : ++49-2173-8509-60

#### Doosan Infracore Yantai Co., LTD :

13 Building, 140 Tianlin Road, Xuhui District, Shanghai, China (200233) Tel : ++86-21-6440-3384 (808, 805) Fax : ++86-21-6440-3389

